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ABSTRACT

This paper presents an overview of the Karnes Ameliorative Curriculum (KAC). The program studies the problems of the preschool handicapped and low-income child and develops and tests approaches and curricula for meeting the needs of these children. Sixteen assumptions underlying the program form the basis of program goals. The goals include a) enhancement of cognitive development with emphasis on language, b) development of motivation conducive to learning, c) development of a positive self-concept, d) acquisition of effective information processing skills, e) enhancement of social competency and emotional development, f) promotion of motor skills development, g) involvement of parents in the educational program, and h) enhancement of staff competencies. The curriculum places an importance on process; however, the process is developed using that content which most effectively bridges the gap between disadvantaged culture and the school culture. The KAC has eight components: science, mathematics, social studies, language, art, directed play, music and movement, and creative and productive thinking. Results of the program indicated that children who have attended KAC, when followed over as long as a 5-year period (end of third grade) achieved the overriding goal of the program-effective participation in a standard school program. A 14-item bibliography is included. (MJM)

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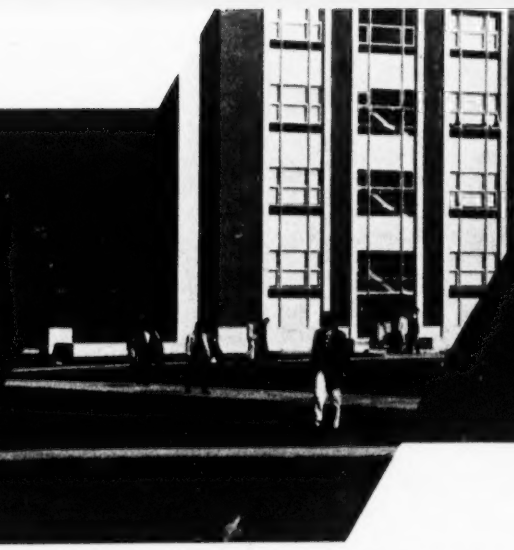

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STRUCTURED COGNITIVE APPROACH FOR EDUCATING YOUNG CHILDREN: REPORT OF A SUCCESSFUL PROGRAM

Merle B. Karnes
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Merle B. Karnes, Ed.D., is professor, Department of Special Education and Institute for Research on Exceptional Children, University of Illinois, Urbana-Champaign Campus. *This report represents nearly a decade of research and development on one of the most important educational challenges of our time. The Karnes Ameliorative Curriculum will be used widely in communities with families of modest means. It is a welcome addition to the drive to offer quality education to all American children.*

For some twelve years prior to joining the staff of the College of Education, University of Illinois, I was director of special services in the Champaign, Illinois, Community Unit IV schools. During those years we developed one of the most comprehensive special education programs in the nation. Because of our demonstrated concern and our success in programming for the individual child who has special needs (handicapped *and* gifted), we were recognized by the National Education Association as a "Pacemaker" school system and were presented with an award.

Despite the fact that we were providing for the special needs of most of the school-age children who deviated markedly intellectually, socially, emotionally, and physically from the so-called "normal" child, I was constantly concerned about the 70 to 80 percent of the children in our special classes for the educable mentally retarded who were from low-income homes. In addition, I was especially distressed that a disproportionate percentage of these children were black. Rarely did these children have preschool experiences at ages 3 and 4, and frequently the first time they were known to the school was when they entered the first grade. Usually, the children were not placed in special classes until they had been in school for several months or even a year or so and were failing. At that time they were chronologically 7, 8, or 9 years of age; had experienced a preponderance of failures; found school a not-too-pleasant place to be; and thus were poorly motivated to learn. They had learned poor habits and were ineffective learners. They were frustrated and felt inadequate. They were so markedly lacking in self-confidence that they were reluctant to accept new tasks. Once they were admitted to a special class, not only were they labeled by their more able peers as "dumb," but their performance continued to reinforce this image since their rate of learning and their achievement continued to lag increasingly farther behind that of their more able peers. No matter how expert the teachers were, it was literally impossible for them to negate or reverse the ill effects of prolonged lack of appropriate stimulation associated with low-income homes coupled with repeated school failure prior to special class placement. I also had the feeling that even children with organic problems associated with mental retardation could have been helped to function at a higher level if they had been identified as early as 3 or 4 years of age and provided with a program designed to help them elevate their functioning in areas of weakness.

Unfortunately, the makeup of the special classes for the retarded in the school system I cited is not atypical. Nationwide the large majority of children in special classes for the educable mentally retarded are from low-income families. I felt confident that if an appropriate educational program were developed for this group of high-risk children that much of the retardation could be prevented, thus reducing the need for a large number of such special classes at the elementary and secondary levels.

While we had in the State of Illinois at that time legislation which provided financial reimbursement to school systems that wished to provide for the physically handicapped as early as 3 years of age, there was no financial encouragement in the way of reimbursement for the mentally retarded at that young age. Therefore, children who had physical problems and were also retarded were not included in the state reimbursement plan beginning at age 3. As we well know, there are more physical problems among low-income children as well as a higher

SP 005 132

percentage of mental retardation. Thus, many of the handicapped children who had the greatest need for early education did not receive it, even in a school system that otherwise had a comprehensive program of special education services. Not only did school systems fail to provide early education for this group of children both in Illinois and nationwide, but these children were also the least likely to be admitted to day care and other public and private programs, especially if parents were required to pay for such services.

In 1965, with a great deal of enthusiasm, I joined the staff of the University of Illinois to become the director of a center so I could devote all my efforts to studying the problems of the preschool handicapped and low-income child and developing and testing approaches and curricula for meeting the needs of these children. It is the program for 3-to-5-year-olds that my associates and I have developed over the last seven years that I will discuss in this paper. My presentation is divided into five parts: (1) Assumptions underlying the program, (2) Goals of the program, (3) Importance of process, (4) Components of the curriculum, and (5) Recognition, results, and outcomes.

ASSUMPTIONS UNDERLYING THE PROGRAM

The assumptions underlying what has been referred to as the "Karnes Ameliorative Curriculum" (defined as an approach which "improves or makes better,") are:

1. The environment of low-income children is inappropriate for developing the skills, knowledge, and attitudes requisite for success in schools which are oriented to the middle class.

2. Appropriate experiences provided low-income children at an early age can contribute to their optimal development and prevent much of the mental retardation currently prevalent among school-age children from low-income homes.

3. The causes for potential school failure are perceived as residing in the discrepancy between the experiences provided in the environment of the child from a low-income home and those needed to ensure his success in the middle-class oriented school rather than as a deficiency within the child. Thus, the child is viewed as having a positive potential for growth which has been impeded by inappropriate experiences associated with a membership in a low-income family. This assumption rejects the need for a remedial approach which accepts the premise that the child has incapacitating deficiencies and needs highly specialized methods and techniques of instruction because his problems are so complex. When one intervenes at an early age, the specificity of training is not such a problem. The children need to be provided with a curriculum that approximates that of the middle-class child to enable him to be successful in school in subsequent years.

4. The earlier the low-income child and his parents and siblings are involved in an intervention program, the greater the potential for enhancement of the young child's subsequent development. Parents and siblings can acquire improved skills in teaching the young child at home.

5. Since educators do not know precisely what content a child is expected to know in subsequent years, process should be given prime importance with content taking a secondary place.

6. An effective educational program should be comprehensive and give due attention to all facets of the child's development. It should be cognitively based, carefully structured, and individualized. To ensure precise planning to meet individual needs, the teacher must set specific objectives for small groups and for individuals and carefully evaluate the child's progress from day to day.

7. It was felt especially important that a high degree of success for the child was particularly necessary to enhance his self concept. Positive reinforcement was held to be of prime importance in promoting the learning of the child.

8. Increasing the child's cognitive functioning, especially in language, will enhance his ability to perceive and cope with his environment, thus promoting his socio-affective development. Verbalizations concurrent with multi-sensory presentation would seem to be a requirement for facilitating effective learning. The game format was felt to lend itself to the promotion of cognitive language development.

9. Since language development is highly related to academic success, any program for low-income children must place a high emphasis on language development.

10. A low teacher-pupil ratio (1:5) is a requisite of an early education program for low-income children since promotion of language development is contingent upon the interactive language behavior between child and adult.

11. The services of the limited number of competent professionals can be extended through the use of paraprofessionals as teachers.

12. A preschool program for the low-income child must be designed to meet the specific needs of groups and individuals but not be so foreign from the educational program in later years that articulation and coordination are impossible.

13. A preschool program for the low-income child must build into its curriculum, instruction that will ensure the child's transferring learning in that setting to the regular school program he will be attending in subsequent years. A curricula which stresses acquisition of information-processing skills would seem to ensure transfer of learning to a greater degree than one which places major stress on acquisition of content.

14. Care must be taken to adequately program for low-income children with high potential, otherwise their full development may be impeded.

15. To ensure the success of a program, there must be a dynamic, on-going, professional growth program for staff. As is true of the program for children, the staff must be perceived as being capable of growth, and individual goals must be set for each staff member toward which he can work to become a more professionally competent person.

16. A model helps organize instruction. Two models seem to particularly lend themselves to this purpose. Since low-income children have inadequate language development, the psycholinguistic theory as represented by the clinical model of the Illinois Test of Psycholinguistic Abilities (ITPA) appeared to afford not only a practical but a theoretically powerful approach. Since the ITPA model does not provide a complete model for the development of

intellectual functioning, a more comprehensive model, the Guilford Structure of the Intellect (SI) (Guilford, 1967) appeared to have promise in providing teachers with guidelines for curriculum development. The SI model was felt to be helpful in ensuring that the teacher provides the children with a broad range of appropriate experiences requiring all types of intellectual operations so as to foster the development of divergent, productive, and evaluative thinking. The SI model complements the ITPA model by extending and expanding the intellectual processing domain.

GOALS OF THE PROGRAM

The goals of the program were necessarily derived from the assumptions upon which the program was built. The overriding goal is to prepare the child from a low-income family to effectively participate in a standard school program. You might assume that we are satisfied with the schools as they are. This is not true by any means, however; it is our feeling the schools can and must change and that if we send the low-income child into the schools substantially different after being provided with an appropriate preschool program—that is if he has good information-processing skills, good work habits, a positive attitude toward school, motivation to learn, and a good content base—schools will have to change.

To reach the overriding goal of the Karnes program, subgoals were established which included the following: (1) Enhancement of cognitive development with emphasis on language, (2) Development of motivation conducive to learning, (3) Development of a positive self-concept, (4) Acquisition of effective information-processing skills, (5) Enhancement of social competency and emotional development, (6) Promotion of motor skills development, (7) Involvement of parents in the educational program, and (8) Enhancement of staff competencies.

IMPORTANCE OF PROCESS

The controversy as to whether to place major emphasis on process or content is ever present when one is developing a curriculum. According to Karnes, Zehrbach, and Teska (1972), *process* refers to the ability to obtain, organize, manipulate, synthesize, and communicate information. They explain that programs which focus on process are concerned about the way in which children think, evaluate, and seek out new information. Emphasis is placed on the processes involved in observing, relating, hypothesizing, and manipulating. The strength of such an approach is that it prepares the child for the continuing acquisition of knowledge. Its weakness appears to be its frequent failure to include bodies of information that may be crucial to the later development of knowledge and process.

Content, on the other hand, is defined as facts, information, and concepts. Concern here is for what a child learns rather than how he learns it or what he does with what he learns. Classroom activities which require strict attention to specific words and concepts, to the reinforcement of these concepts, and to the day-to-day sequencing of these concepts are content-oriented. The goal is to teach the information needed to function adequately in standard classrooms. In such a preschool program, the minimal content necessary for effective learning in later school has been identified and sequenced for presentation to the child. Such an approach establishes a finite body of material to be taught but may fail to provide the child with the opportunity to relate what he has learned to other tasks and areas. Further, since our society is changing at a rapid rate, considerable effort is required to ensure that the content is always relevant.

The process-content controversy merits particular consideration in curriculum development for children from low-income homes who typically lack certain types of concepts, especially in the language areas, but who also have difficulty in processing information in a school setting. These children need to acquire additional processes for organizing and internalizing their experiences as well as the content typically held by middle-class children.

The characteristics of the pupils that a classroom teacher is working with help determine the position that she must take on the process-content continuum. If the children being served have the broad informational background typical of middle-class school oriented children, then the teacher will be able to move more toward the process end of the continuum without encountering lacks in the content area.

The Karnes Ameliorative Curriculum (KAC) has assigned top priority to process; however, since process can be developed through a variety of content and since children from low-income homes lack certain types of content, process is developed using that content which most effectively bridges the gap between the disadvantaged culture and the school culture.

COMPONENTS OF THE CURRICULUM

The KAC for 3-to-5-year-old children has eight components: (1) Science, (2) Mathematics, (3) Social Studies, (4) Language, (5) Art, (6) Directed Play, (7) Music and Movement, and (8) Creative and Productive Thinking (Guilford Activities). The activities in these areas are presented in the form of sequential model lesson plans which include specific behavioral objectives and criterion tasks.

The *Science* component of the curriculum offers children a variety of experiences in areas generally considered basic to the science offerings of the elementary school classroom. A major goal of this portion of the curriculum is to help the preschool child become increasingly aware of his environment in relation to himself and, therefore, those areas which comprise his environment—air, water, sound, light, animals, weather, plants—are included. Each child will acquire essential skills of observation and a vocabulary which will assist him in making further observations, asking questions, and expanding his knowledge of his environment.

The *Mathematics* facet of the curriculum is designed to help the child acquire factual knowledge and, as is true of all other components of the curriculum, affective behavior and language development are fostered. The curriculum is divided into pre-number units—Geometric Figures, Sets and One-to-One Matching, Ordering, and Dimensional Terms—which provide the basic understandings prerequisite to number and numerals.

The *Social Studies* component is designed to introduce the child to himself. It helps him answer the question, "Who Am I?" The curriculum leads the child step by step from that which should be most familiar to him—himself—to his most immediate environment--his family and home—and, finally, to the more complex world of interaction outside his home—the community. Through the use of this curriculum, the child becomes more aware of himself as a unique individual and as a valuable group member; in addition, he becomes cognizant of the important roles others play in his life. The fourteen units covered in this area of the curriculum are: (1) Self-Concept, (2) Body Parts, (3) Function of Body Parts, (4) Clothing, (5) Emotions, (6) Attitudes of Behavior, (7) The Family, (8) The Home, (9) Pets, (10) Communication, (11) Community Workers, (12) Transportation, (13) Buildings, and (14) The City.

While language development is one of the primary goals of the program and is stressed throughout the day, a portion of each day is specifically devoted to fostering improved language. The lesson plans included in the *Language Processing* curriculum are classified under subheadings derived from the clinical model of the Illinois Test of Psycholinguistic Abilities. These areas are: (1) Auditory Reception, (2) Visual Reception, (3) Verbal Expression, (4) Manual Expression, (5) Auditory Sequential Memory, (6) Visual Sequential Memory, (7) Grammatic Closure, (8) Auditory Association, (9) Visual Association, (10) Visual Closure, (11) Auditory Closure, and (12) Sound Blending. These lesson plans may be used to foster continued language development in all facets of language. They are, however, especially designed to help children ameliorate specific weaknesses in areas where the child manifests a weakness. While the results of an ITPA evaluation are especially useful in delineating strengths and weaknesses of a given child, in the absence of test results, areas requiring remediation may be identified by the teacher following an observation schedule.

The *Art* curriculum is designed to assist the teacher in creating an environment conducive to the general growth and development of young children. Further, the preschool art activities necessarily provide opportunities to develop many skills and behaviors requisite for later school success. Each child is encouraged through the use of a variety of art media to progress at his own rate through the developmental stages of children's art—the manipulative stage, the symbolic stage, and the pictorial stage.

Directed Play periods are felt to be an integral part of the curriculum. Play which is conducive to promoting the growth of the child is facilitated by careful planning on the part of the teacher. It provides a developmental base for the total child—intellectually, physically, socially, and emotionally. Through play both affective and cognitive processes can be supported. The young child can be helped to develop desirable attitudes, motivation, skills, and a sense of competence necessary for later success. In the current push for academic gains and cognitive development, the affective domain too often takes a secondary role. The rationale for this area of the curriculum is to emphasize the value and importance of both areas, and present positive methods for utilizing play to achieve these goals.

The Music and Movement areas of the curriculum provide opportunities for the child to explore concepts and participate in experiences which promote an appreciation of music. The movement aspect of the program seeks to further enhance the cognitive and affective development of the child, using a more creative approach through spontaneous participation. The body is the agent or instrument of movement. This curriculum does not require that the teacher have special training in music. With enthusiasm and careful planning, the teacher can help each child develop in the following important areas: (1) language, (2) listening skills, (3) body awareness, and (4) social competency.

The *Creative and Productive Thinking* activities included in the curriculum follow the instructional model derived from Guilford's Structure of the Intellect and thus are referred to as *Guilford Activities.* This area of the curriculum is designed to promote the development of each child in all phases of intellectual functioning. Logical, critical, and productive thinking are stressed in this facet of the curriculum. The three dimensions of the instructional model are *Operations, Content,* and *Products.* When the teacher has learned the three dimensions, he is able to think of each activity according to the process, content, and operations required by that activity.

RECOGNITION, RESULTS, AND OUTCOMES

Program Recognition

As early as 1967, CBS chose our program, especially the parent component as one of the most innovative in the country. They brought their technicians here and spent a week filming the program.*

The Office of Education designated our program as a successful program and included it in a series of publications titled *It Works.* The American Research Institute (1968) was charged by the U.S. Office of Education to review compensatory programs from 1963 to 1968. Researchers Hawkridge, Chalupsky, and Roberts reviewed 1,000 projects (preschool through grade 12) nominated for study throughout the country and found that only twenty-one met the criteria of either improved intellectual or academic performance. Only six were preschool projects, and we were pleased that the Karnes program was chosen as one of the six.

In 1970, the Division of Consulting Psychology of the American Psychological Association chose the research conducted by Karnes and her associates as one of three research endeavors most likely to influence practice.

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*The results of the filming were seen on *The Twentieth Century* program in a sequence entitled *From Cradle to Classroom.*

In 1971, the Office of Child Development requested a follow-up report on the Karnes program to be included in a government publication on successful programs.

Research Methodology and Results

No attempt will be made here to compare the Karnes program with other programs; however, the references for such comparisons will be provided in the event the reader wishes to obtain such information.

To give the reader a better understanding of some of the important results of the research program, a brief background on the research methodology is deemed necessary.[1]

The subjects for this study were selected from the preschool population of the economically depressed neighborhoods of Champaign-Urbana, a community of 100,000 in central Illinois. Families judged by public aid and school authorities to be economically and educationally deprived were canvassed for children who had no previous preschool experience and who would be four years old before the first of December, an age appropriate for enrollment in public kindergarten the following year. A home interviewer determined final eligibility after she had completed a detailed family history. In addition, interviewers canvassed certain acutely disadvantaged sections of the city to locate children new to the community or otherwise unknown to the referring agencies.

The 1960 Stanford-Binet Intelligence Scale was administered to eligible children who were then stratified on the basis of their intelligence quotients into three groups: IQ scores 100 and above, 90 through 99, and 70 through 89. The children were assigned to class units (N=15) in which one-third of each class consisted of children who had scored in the "high" IQ range; one-third, the "middle" range; one-third, the "low" range. Mean intelligence quotients were then computed for the three strata and for each class unit. One teacher was assigned to each group in a unit.

Children attended school for approximately two hours and fifteen minutes. The daily schedule was divided so that there were three 20-minute structured learning periods: math concepts, language arts and reading readiness, and science-social studies. A large room where the 15 children could gather for group activities was available; however, small-group instruction took place in cubicles which contained materials appropriate to the three content areas, and each teacher moved from one cubicle to another with her group of five children. Concepts taught during the structured periods were reinforced during directed play and especially during the music period.

At the end of the first year (7- to 8-month interval), the children enrolled in the KAC program demonstrated a 14-point mean gain in *intellectual functioning* on the Stanford-Binet Individual Intelligence Scale. No child failed to make an IQ gain, and only 2 of 25 children scored below 100 on post test.

On the initial assessment of *language development* (ITPA), the children were found to be more deficient (approximately one year) in three subtests related to verbal expressive abilities: Vocal Encoding (verbal expression), Auditory Vocal Automatic (grammar), and Auditory Vocal Association. During the first year, the KAC children eliminated their major initial deficiency on each of these three subtests. On the total ITPA, the children made consistent gains which resulted in an essentially non-deficit performance at the end of the first year.

The performance of the children on *visual perception* (Frostig) at the end of the first year indicated that almost 80 percent of the children made progress that indicated no need for remediation. It appeared that verbalizations in conjunction with productive, manipulative experience may have enhanced the children's progress on the measure of visual perception as well as the visual motor skills involved in certain ITPA subtests (Visual Decoding, Visual Motor Sequencing, and Motor Encoding).

The second year of the program the children attended the public schools and returned to the research center for a one-hour supportive program designed to promote school readiness. Because the ITPA data at the end of the first year indicated that the children had essentially a non-deficit performance, language was not given major emphasis in the supportive program. At the end of the second year, the children essentially maintained the IQ gains of the previous year but on the ITPA there was a definite regression. These results are an indictment of public school programming for children from low-income homes and are an endorsement for the need for continued special programming in language.

The above was confirmed by the assessment of *school readiness* (Metropolitan). The children made good progress in this area. Thirty-eight percent of the children achieved a superior reading readiness status, and 67 percent of the children were rated high normal and above; thus, there was a favorable reading prediction for a large number of the children. On the Metropolitan Number Readiness Test, 83 percent of the children achieved a superior number readiness status. The additional one hour supportive program *did* promote superior academic readiness but failed to maintain the level of language functioning achieved in the first year.

School achievement at the end of the first grade was considered to be a critical criterion for assessing program effectiveness. Results of the group on the California Reading Achievement Test indicated that the mean was nearly a half year above grade level.

[1] This research was supported in part by OE, OEO, and OCD.

As the children entered the public schools, the high IQ strata group fared least well of the three groups. Some of the gains made by these children in the first year of the program were lost during the first grade. It seems that the public schools failed these children with high potential.

At the end of the third grade, follow-up data gathered on intellectual functioning and achievement revealed that the children had maintained 7 of 14 IQ points gained the first year and were slightly above grade level in reading (Figures 1 and 2).

All of the children who entered the program at age 4 and who were in the fourth grade in the spring of 1971 are in regular classes (N=24). *Not one* of the group has been referred or placed in a special class for the mentally retarded.

A final case study that substantiates even more the effectiveness of the KAC involved another group of children with initial IQs ranging from 37 to 75 (Binet IQ). At the end of the first year, the mean IQ gain for the group was 21 points. No child made a gain of less than 5 IQ points, and 80 percent of the children made gains of 15 points or more. Initially, many of these children could not perform on the ITPA. Thus, it was impossible to obtain mean gain scores on this group; however, post test results indicated that with the exception of the auditory-vocal automatic subtest, virtually all of the children fell within the normative range of this instrument, which indicates that they did make progress. Substantial deficits remained, particularly on subtests requiring verbal expressive abilities. The child with an initial IQ of 37 obtained an IQ of 57 at the end of the first year. He was kept in the KAC program the second year, and his intellectual functioning at the end of the second year increased to 84. He was staffed with personnel in the public schools which resulted in a decision to place him in a regular class with supportive services from a resource teacher of children with learning disabilities. This white child represents the most severely retarded of any child we have had in the program to date. In addition to mental retardation, he had a number of other handicapping conditions suggesting neurological problems. One bit of information which makes this subject particularly interesting is that he has a sister in the trainable class and other siblings in classes for the mentally retarded. We have felt particularly joyous over the fact that we not only kept this child from being placed in a trainable class where he would probably have remained, but follow-up data at the end of the third year revealed that he is making average progress in a regular class, including academic areas.

Children who have attended the Karnes Ameliorative Curriculum when followed over as long as a five-year period (end of third grade) achieved the overriding goal of the program—*effective participation in a standard school program.* For this we are grateful. We believe we have found the answer to many of the challenges in this area. Our goal now is to perfect our techniques even further and to share our approaches with others.

Fig - 1

Stanford - Binet

MEAN IQ DATA

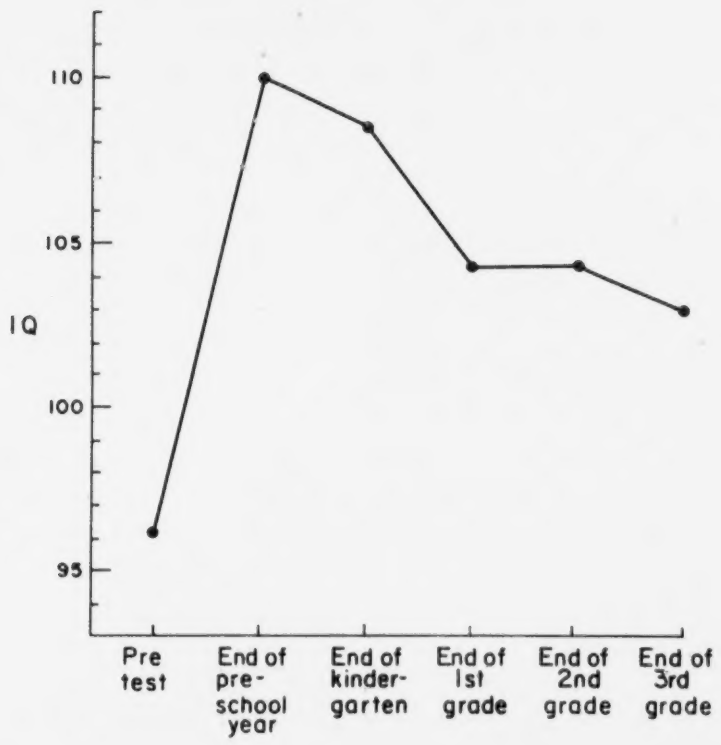
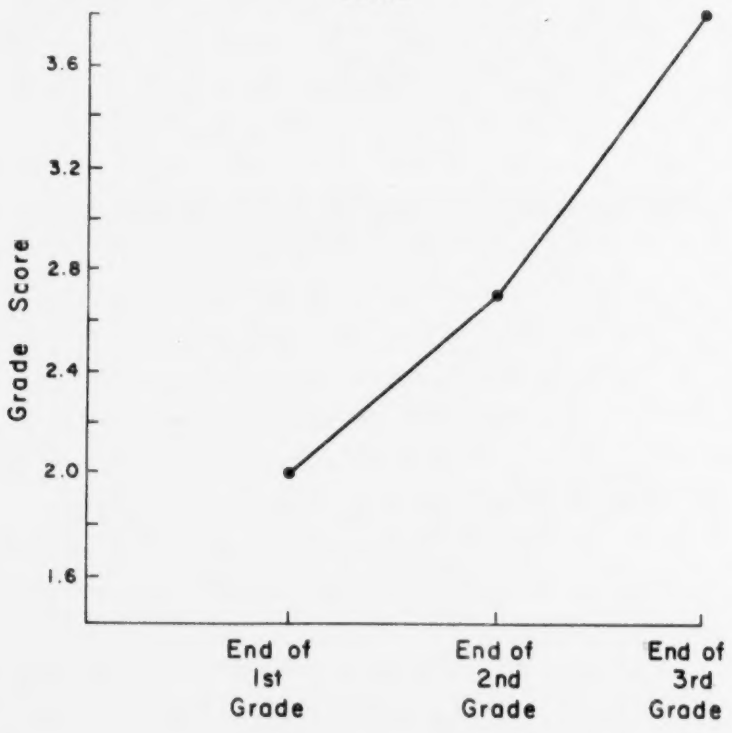


Fig 2

California Achievement Test

MEAN TOTAL READING GRADE PLACEMENT SCORE



References

Guilford, J. P. *The nature of human intelligence.* New York: McGraw Hill, 1967.

Karnes, M. B., Studley, Wm. M., Wright, W. R. & Hodgins, A. S. An approach for working with mothers of disadvantaged preschool children. *Merrill-Palmer Quarterly,* 1968, *14*, 174-184.

Karnes, M. B., Wollersheim, J. P., Stoneburner, R. L., Hodgins, A. S., & Teska, J. A. An evaluation of two preschool programs for disadvantaged children: A traditional and a highly structured experimental preschool. *Exceptional Children,* May 1968, *34,* 667-676.

Karnes, M. B., Hodgins, A. S., Stoneburner, R. L., Studley, Wm. M., & Teska, J. A. Effects of a highly structured program of language development on intellectual functioning and psycholinguistic development of culturally disadvantaged three-year-olds. *Journal of Special Education,* 1968, *2,* 405-412.

Karnes, M. B., & Hodgins, A. S. The effects of a highly structured program on the measured intelligence of culturally disadvantaged four-year-old children. *Psychology in the Schools,* 1969, *6* (1), 89-91.

Karnes, M. B., Hodgins, A. S., & Teska, J. A. *Investigations of classroom and at-home interventions.* Vol. I. *Research and development program on preschool disadvantaged children. Final Report.* Bethesda, Md.: ERIC Document Reproduction Service (ED 036 663), 1969.

Karnes, M. B. Family involvement in educating the handicapped: Utilizing research findings from culturally disadvantaged. In *Selected Convention Papers, 47th Annual international Convention.* Arlington, Va.: Council for Exceptional Children, 1969, p. 499-504.

Karnes, M. B., Hodgins, A. S., & Teska, J. A. A longitudinal study of disadvantaged children who participated in three different preschool programs. In *Selected Convention Papers, 47th Annual International Convention.* Arlington, Va.: Council for Exceptional Children, 1969, p. 438-454.

Karnes, M. B., Teska, J. A., & Hodgins, A. S. The effects of four programs of classroom intervention on the intellectual and language development of four-year-old disadvantaged children. *American Journal of Orthopsychiatry,* January, 1970, *40* (1), 58-76.

Karnes, M. B., Teska, J. A., & Hodgins, A. S. The successful implementation of a highly specific preschool instructional program by paraprofessional teachers. *Journal of Special Education,* 1970, *4,* 69-80.

Karnes, M. B., Teska, J. A., Hodgins, A. S., & Badger, E. D. Educational intervention at home by mothers of disadvantaged infants. *Child Development,* December, 1970, *41,* 925-935.

Karnes, M. B., Zehrbach, R. R., & Teska, J. A. A new professional role in early childhood education. *Interchange,* 1971, *2* (2), 89-105.

Karnes, M. B., Zehrbach, R. R., & Teska, J. A. The conceptualization of the ameliorative curriculum. In R. K. Parker (Ed.), *Perspective on early education.* Boston: Allyn and Bacon, 1972 (in press).

Karnes, M. B., Zehrbach, R. R., & Teska, J. A. The Karnes Preschool Program: Rationale, curricula offerings, and follow-up data. Office of Child Development (in press).